Notice of Allowability	Application No.	Applicant(s)	
	10/696,926	NIEMINEN, ESKO	
	Examiner	Art Unit	
	Esaw T. Abraham	2112	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *Amdt filed on 05/25/05*.

2. ☒ The allowed claim(s) is/are *1-34*.

3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
   a) ☐ All b) ☐ Some* c) ☐ None of the:
      1. ☐ Certified copies of the priority documents have been received.
      2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
      3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
   (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☒ Interview Summary (PTO-413), Paper No./Mail Date _____ .
7. ☒ Examiner's Amendment/Comment
8. ☐ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

GUY LAMARRE
PRIMARY EXAMINER

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and or additions be acceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no latter than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Harry F. Smith on 06/20/07.

2. The application has been amended as follows:

As per claim 1:

Lines 3, 4 and 6: Insert ---decoding--- before the word "rounds"

Line 5: Replace the word "of" with ---derived from--- before "at least".

Line 7: Replace "values of" with ---the value derived from--- before "the at least"

Line 8: Replace the word "values" with ---value--- after "monitored".

As per claim 10:

Lines 3, 5 and 7: Insert ---decoding--- before "rounds"

Line 6: Replace the word "of" with ---derived from--- before "at least".

Line 8: Replace "values of" with ---the value derived from the--- before " at least"

Line 9: Replace the word "values" with ---value--- after "monitored".

Examiner's statement for reason for allowance

3. Claims **4-7, 9, 13-16 and 18** have been previously allowed.

Claims **1-3, 8, 10-12, 17 and 19-29** have been allowed.

The following is an examiner's statement for allowance:

As per claim 1:

The prior art of record Wolf et al. teach or disclose an error control systems in data transmission, especially to iterative decoding using parallel concatenated encoders, such as turbo decoders (see col.1, lines 11-15). Wolf teaches a stopping criterion has been developed for turbo decoding that measures the SNR of the extrinsic and compares the result to a threshold and if the threshold is reached, no further iterations are executed (see col. 6, lines 25-27). Kanai et al. in an analogous art, FIG. 4 teach a Turbo decoder (301) iterates error correcting decoding on the received coded sequences, and outputs decoded results to error checker (302) performs error detection on the decoded result (error detecting code) output from turbo decoder (301), thereby checks whether an error is contained in the decoded result, and outputs a check result signal (OK signal (valid code) or NG signal (noise) indicative of the check result to iteration controller 303. When determining there is an error, error checker (302) outputs a NG signal to iteration controller (303), while outputting an OK signal to iteration controller 303 when determining there is no error and further the Iteration controller (303) determines whether turbo decoder (301) continues or finishes the iteration decoding, and when finishing the iteration, controls turbo decoder 301 to finish the iteration decoding (see col. 6, lines 13-34). However, the prior art taken singly or in combination fail to teach, anticipate, suggest, or render obvious a method of executing in a decoder an iterative turbo decoding process comprising a plurality of rounds on a

signal received from a channel, at each of the plurality of decoding rounds, determining a soft value that depends in part on a value derived from at least one extrinsic value, monitoring, during the plurality of decoding rounds operation the value derived form the at least one extrinsic value; and based on a change in the monitored value, determining whether the signal comprises a valid code word or comprises only noise, and based on the determining, outputting from the decoder a decision on whether or not the signal comprises a valid code word. Consequently, claim 1 is allowed over the prior art.

Claims **2, 3, 8 and 30,** are allowable based on their dependence upon allowable base claim.

As per claim 10:

The prior art of record Wolf et al. teach or disclose an error control systems in data transmission, especially to iterative decoding using parallel concatenated encoders, such as turbo decoders (see col.1, lines 11-15). Wolf teaches a stopping criterion has been developed for turbo decoding that measures the SNR of the extrinsic and compares the result to a threshold and if the threshold is reached, no further iterations are executed (see col. 6, lines 25-27). Kanai et al. in an analogous art, FIG. 4 teach a Turbo decoder (301) iterates error correcting decoding on the received coded sequences, and outputs decoded results to error checker (302) performs error detection on the decoded result (error detecting code) output from turbo decoder (301), thereby checks whether an error is contained in the decoded result, and outputs a check result signal (OK signal (valid code) or NG signal (noise) indicative of the check result to iteration controller 303. When determining there is an error, error checker (302) outputs

a NG signal to iteration controller (303), while outputting an OK signal to iteration controller 303 when determining there is no error and further the Iteration controller (303) determines whether turbo decoder (301) continues or finishes the iteration decoding, and when finishing the iteration, controls turbo decoder 301 to finish the iteration decoding (see col. 6, lines 13-34). However, the prior art taken singly or in combination fail to teach, anticipate, suggest, or render obvious means for executing in a plurality of rounds an iterative turbo decoding process on a signal received from a channel, means for determining, at each of the plurality of decoding rounds, a soft value that depends in part on a value derived from at least one extrinsic value, means for monitoring, during the plurality of decoding rounds the value derived from the at least one extrinsic value, and means, responsive to a change in the monitored value, for determining whether the signal comprises a valid code word or comprises only noise, and means for outputting, from the means for executing and based on the means for determining, a decision on whether or not the signal comprises a valid code word. Consequently, claim 10 is allowed over the prior art.

Claims **11, 12, 17 and 31,** are allowable based on their dependence upon allowable base claim.

As per claim 19:

The prior art of record Wolf et al. teach or disclose an error control systems in data transmission, especially to iterative decoding using parallel concatenated encoders, such as turbo decoders (see col.1, lines 11-15). Wolf teaches a stopping criterion has been developed for turbo decoding that measures the SNR of the extrinsic

and compares the result to a threshold and if the threshold is reached, no further iterations are executed (see col. 6, lines 25-27). Kanai et al. in an analogous art, FIG. 4 teach a Turbo decoder (301) iterates error correcting decoding on the received coded sequences, and outputs decoded results to error checker (302) performs error detection on the decoded result (error detecting code) output from turbo decoder (301), thereby checks whether an error is contained in the decoded result, and outputs a check result signal (OK signal (valid code) or NG signal (noise) indicative of the check result to iteration controller 303. When determining there is an error, error checker (302) outputs a NG signal to iteration controller (303), while outputting an OK signal to iteration controller 303 when determining there is no error and further the Iteration controller (303) determines whether turbo decoder (301) continues or finishes the iteration decoding, and when finishing the iteration, controls turbo decoder 301 to finish the iteration decoding (see col. 6, lines 13-34).

However, the prior art taken singly or in combination fail to teach, anticipate, suggest, or render obvious a turbo decoder having an input for coupling to a signal received through a channel, said turbo decoder configured to iteratively decode the signal in a plurality of decoding rounds by determining at each of the plurality of rounds a soft value that depends in part on a value of at least one extrinsic value; and a detector coupled to the turbo decoder and configured to monitor, during the plurality of decoding rounds values of the at least one extrinsic value and configured to determine, for use in determining based on a change in the monitored values, whether the signal comprises a valid code word or comprises only noise, and said turbo decoder further

configured to output, based on the determination, a decision on whether or not the signal comprises a valid code word.

Claims 21 and 22 and 32, are allowable based on their dependence upon allowable base claim.

As per claim 23:

The prior art of record Wolf et al. teach or disclose an error control systems in data transmission, especially to iterative decoding using parallel concatenated encoders, such as turbo decoders (see col.1, lines 11-15). Wolf teaches a stopping criterion has been developed for turbo decoding that measures the SNR of the extrinsic and compares the result to a threshold and if the threshold is reached, no further iterations are executed (see col. 6, lines 25-27). Kanai et al. in an analogous art, FIG. 4 teach a Turbo decoder (301) iterates error correcting decoding on the received coded sequences, and outputs decoded results to error checker (302) performs error detection on the decoded result (error detecting code) output from turbo decoder (301), thereby checks whether an error is contained in the decoded result, and outputs a check result signal (OK signal (valid code) or NG signal (noise) indicative of the check result to iteration controller 303. When determining there is an error, error checker (302) outputs a NG signal to iteration controller (303), while outputting an OK signal to iteration controller 303 when determining there is no error and further the Iteration controller (303) determines whether turbo decoder (301) continues or finishes the iteration decoding, and when finishing the iteration, controls turbo decoder 301 to finish the iteration decoding (see col. 6, lines 13-34).

However, the prior art taken singly or in combination fail to teach, anticipate, suggest, or render obvious a turbo decoder having an input for coupling to a signal received through a channel, said turbo decoder configured to iteratively decode the signal in a plurality of decoding rounds by determining at each of the plurality of rounds a soft value that depends in part on a value of at least one extrinsic value; and a detector coupled to the turbo decoder and configured to monitor, during the plurality of decoding rounds values of the at least one extrinsic value and configured to determine, for use in determining based on a change in the monitored values, whether the signal comprises a valid code word or comprises only noise, and said turbo decoder further configured to output, based on the determination, a decision on whether or not the signal comprises a valid code word.

Claims 24-27 and 33, are allowable based on their dependence upon allowable base claim.

As per claim 28:

The prior art of record Wolf et al. teach or disclose an error control systems in data transmission, especially to iterative decoding using parallel concatenated encoders, such as turbo decoders (see col.1, lines 11-15). Wolf teaches a stopping criterion has been developed for turbo decoding that measures the SNR of the extrinsic and compares the result to a threshold and if the threshold is reached, no further iterations are executed (see col. 6, lines 25-27). Kanai et al. in an analogous art, FIG. 4 teach a Turbo decoder (301) iterates error correcting decoding on the received coded sequences, and outputs decoded results to error checker (302) performs error detection

on the decoded result (error detecting code) output from turbo decoder (301), thereby checks whether an error is contained in the decoded result, and outputs a check result signal (OK signal (valid code) or NG signal (noise) indicative of the check result to iteration controller 303. When determining there is an error, error checker (302) outputs a NG signal to iteration controller (303), while outputting an OK signal to iteration controller 303 when determining there is no error and further the Iteration controller (303) determines whether turbo decoder (301) continues or finishes the iteration decoding, and when finishing the iteration, controls turbo decoder 301 to finish the iteration decoding (see col. 6, lines 13-34).

However, the prior art taken singly or in combination fail to teach, anticipate, suggest, or render obvious a turbo decoder having an input for coupling to a signal received through a channel, said turbo decoder configured to iteratively decode the signal in a plurality of decoding rounds by determining at each of the plurality of rounds a soft value that depends in part on a value of at least one extrinsic value; and a detector coupled to the turbo decoder and configured to monitor, during the plurality of decoding rounds values of the at least one extrinsic value and configured to determine, for use in determining based on a change in the monitored values, whether the signal comprises a valid code word or comprises only noise, and said turbo decoder further configured to output, based on the determination, a decision on whether or not the signal comprises a valid code word.

Claim 34, are allowable based on their dependence upon allowable base claim.

Conclusion

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Esaw T. Abraham whose telephone number is (571) 272-3812. The examiner can normally be reached on M-F 8am-4PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jacques Louis-Jacques can be reached on (571) 272-6962. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Esaw Abraham

Art unit: 2112

GUY LAMARRE
PRIMARY EXAMINER